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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,590	02/15/2005	Naohiro Matsunaga	019519-455	6557

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EXAMINER

HON, SOW FUN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/524,590	Applicant(s) MATSUNAGA ET AL.	
	Examiner Sow-Fun Hon	Art Unit 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/15/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura (US 6,383,559).

Regarding claim 1, Nakamura teaches an antireflection film comprising: a transparent support 13 (column 4, lines 1-5); and as an outermost layer, a low refractive index layer (11, column 4, lines 1-5, Fig. 1) containing a fluorine-containing polymer (microparticles 41, column 5, lines 35-36, fluorine-containing shell polymer, column 11, lines 40-50), wherein the low refractive index layer contains at least one inorganic fine particle (41, column 5, lines 35-36, 50-51) having an average particle size of 50% of the thickness of the low refractive index layer (11, Fig. 1).

Regarding claim 2, Nakamura teaches that the antireflection film has at least one hard coat layer between the transparent support and the low refractive index layer (intermediate layer such as a hard coating layer provided on the support, column 15, lines 55-57).

Regarding claim 3, Nakamura teaches that the inorganic particle is a silica fine particle (column 22, lines 25-28).

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Regarding claim 9, Nakamura teaches that the antireflection film comprises at least one high refractive index layer (34, column 5, lines 1-2, Fig. 3) between the transparent support (film 33, column 5, line 1, Fig. 3) and the low refractive index layer (33, column 5, line 7, Fig. 3), wherein the high refractive index layer is a layer having a refractive index of 1.7 to 2.2 which is within the claimed range of 1.55 to 2.40, and mainly comprising: titanium dioxide (column 24, lines 21-23); and an inorganic fine particle containing zirconium (column 14, lines 39-43).

Regarding claim 10, Nakamura teaches that the low refraction index layer has a refractive index of 1.20 to 1.40 (column 3, lines 25-28), which is within the claimed range of 1.20 to 1.49.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4, 8, 11, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura as applied to claims 1-3, 9-10 above.

Nakamura teaches the antireflection film comprising the low refractive index layer wherein at least one inorganic fine particle having an average particle size with the range of 30 to 100% of the thickness of the low refractive index layer as described

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above. In addition, Nakamura teaches that the inorganic fine particle is silica (silicon dioxide, column 8, line 50).

Regarding claim 4, Nakamura fails to disclose that the low refractive index layer further comprises at least one silica fine particle having a particle size of less than 25% of the thickness of the low refractive index layer.

However, Nakamura teaches that a dispersion of the inorganic particles can be prepared by mechanical crushing (column 8, lines 58-61), which means that there is a distribution of particle sizes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have mechanically crushed the starting inorganic particles, with a resultant distribution of particle sizes, wherein there is at least one silica fine particle having a particle size of less than 25% of the thickness of the low refractive index layer, in order to provide a dispersion to form the low index refractive layer, as taught by Nakamura.

Regarding claim 8, Nakamura fails to disclose that the hard-coat layer is a light-diffusing layer, which has a scattered light intensity at 30° of 0.01 to 0.2% based on the light intensity at an exit angle of 0° in a scattered light profile by a goniophotometer.

However, Nakamura teaches that the average scattered light intensity of the anti-reflection film is 0.3% (reflectance, column 21, lines 15-18). Hence it would have been a matter of routine experimentation to have optimized the process of making the antireflection film so that the hard coat layer is a light-diffusing layer which has a scattered light intensity at 30°, within the claimed range of 0.01 to 0.2% based on the

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light intensity at an exit angle of 0° in a scattered light profile by a goniophotometer, for the purpose of obtaining the desired average scattered light intensity of 0.3% for the antireflection film.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have optimized the process of making the antireflection film of Nakamura, to obtain a hardcoat layer which is a light-diffusing layer with a scattered light intensity at 30° , within the claimed range of 0.01 to 0.2% based on the light intensity at an exit angle of 0° in a scattered light profile by a goniophotometer, in order to provide the desired average scattered light intensity of 0.3% for the antireflection film, as taught by Nakamura.

Regarding claim 11, Nakamura teaches a polarizing plate whose one surface is the anti-reflection film (column 18, lines 7-13). A polarizing plate comprises a polarizer and two protective films, one on each side. Thus, the polarizing plate of Nakamura comprises a polarizer and two protective films of the polarizer, wherein one of the two protective films of the polarizer is the antireflection film.

Regarding claim 13, Nakamura teaches an image display device comprising the anti-reflection film, and the polarizing plate comprising the anti-reflection film (liquid crystal display, column 18, lines 14-17), and that the reflection or phenomenon of displaying a background view on the surface [of the display] was greatly reduced (column 18, lines 13-17). Thus, the anti-reflection film is the outermost surface of the display.

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3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura as applied to claims 1-3, 9-10 above, and further in view of Yasuda (US 6,210,858).

Nakamura teaches the antireflection film comprising the low refractive index layer wherein at least one inorganic fine particle having an average particle size with the range of 30 to 100% of the thickness of the low refractive index layer as described above. In addition, Nakamura teaches that the refractive index of the particle is generally 1.25 to 1.45 (column 4, lines 22-25), made of silica (silicon dioxide, column 8, line 50). Nakamura fails to teach that at least one of the silica particles in the low refractive index layer is a hollow silica fine particle having a refractive index of from 1.17 to 1.40.

However, Yasuda teaches an antireflection film comprising inorganic fine particles of hollow silica (porous, column 1, lines 65-67), and that the refractive index is decreased by micro voids (column 2, lines 32-35).

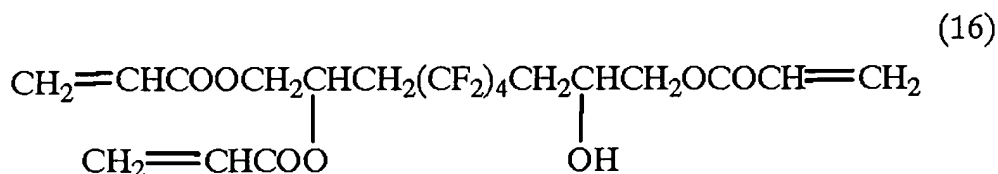
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a hollow silica fine particle having a refractive index of from 1.17 to 1.40, as one of the silica particles in the low refractive index layer of Nakamura, in order to provide the desired reduction in refractive index of the low refractive index layer, as taught by Yasuda.

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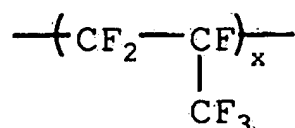
4. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura as applied to claims 1-, 9-10 above, and further in view of Yoshida (US 6,254,973).

Nakamura teaches the fluorine-containing polymer contained in the low refractive index layer of the antireflection film, as described above. Nakamura fails to teach that the fluorine-containing polymer is a copolymer (P) having a main chain consisting of only carbon atoms, wherein the copolymer comprises a fluorine-containing vinyl monomer polymerization unit; and a polymerization unit having a (meth)acryloyl group on the side chain, let alone that the copolymer (P) is represent by Applicant' formula 1.

However, Yoshida teaches an antireflection film (reflection reducing film, abstract) formed from polymerizing the fluorine-containing monomer (curing, abstract, column 13, lines 36-42) shown below.

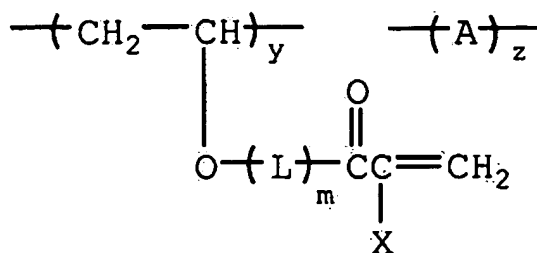


The $-(\text{CF}_2)_4-$ in the middle of the monomer provides two repeat units of $-(\text{CF}_2-\text{CF}_2)-$ which is a homolog of the claimed fluorine-containing moiety shown below, with $x = 2$.



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The left portion of the monomer shown on the previous page provides the claimed repeat unit shown below on the left, $y = 1$, $m = 0$, $X = H$.



Yoshida teaches that the layer formed from the monomer has low refractive index, high surface hardness, and high adhesion (column 11, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a copolymer with formula 1 of Applicant, as the fluorine-containing polymer of Nakamura, in order to provide the desired high surface hardness and high adhesion, as taught by Yoshida.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura as applied to claims 1-, 9-11 above, and further in view of Yamaguchi (US 6,633,353).

Nakamura teaches a liquid crystal display device comprising a polarizing plate comprising a polarizer and two protective films of the polarizer, wherein one of the two protective films of the polarizer is the antireflection film described above. Nakamura fails to disclose the mode or type of liquid crystal display device.

However, Yamaguchi teaches that a TN-mode reflective type (twisted nematic, column 5, lines 14-16) or STN-mode (super-twisted-nematic, column 5, lines 22-24)

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uses a polarizing plate comprising a polarizer with an antireflection film (polarizing film 10 subjected to anti-reflection treatment, column 7, lines 43-47).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the polarizing plate comprising antireflection film of Nakamura in a liquid crystal display device of the TN or STN-mode reflective type, in order to provide the desired mode and type of display, as taught by Yamaguchi.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Yamaguchi as applied to claims 11, 14 above, and further in view of Yang (US 6,181,400).

Nakamura in view of Yamaguchi, teaches a polarizing plate comprising a polarizer and two protective films, wherein one of the protective films is the antireflection film described above. In addition, Yamaguchi teaches that the film other than the antireflection film of the two protective films of the polarizer is an optical compensation film (layer 12, column 7, lines 43-49). Nakamura in view of Yamaguchi, fails to teach that the optical compensation film comprises an optically anisotropic layer, wherein the layer has a negative birefringence and comprises a compound having a discotic structural unit, the disc plane of the discotic structural unit is inclined with respect to the surface protective film plane, and the angle made by the disc plane of the discotic structural unit and the surface protective film plane is changed in the depth direction of the optically anisotropic layer.

However, Yang teaches the use of an optical compensation film comprising an optically anisotropic layer which has negative birefringence, comprising a compound

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having a discotic structural unit, the disc plane of the discotic structural unit is inclined with respect to the surface protective film plane, and the angle made by the disc plane of the discotic structural unit is changed in the depth direction of the optically anisotropic layer discotic-type liquid crystalline film with negative birefringence (twist discotic-type liquid crystalline film with negative birefringence as a compensation film for a liquid crystal display, abstract) for the purpose of providing better view-angle characteristics, less color-shift and faster response times for the twisted liquid crystal display (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the optical compensation film of Yang as the optical compensation film of Nakamura in view of Yamaguchi, in order to provide better view-angle characteristics, less color-shift and faster response times for the twisted liquid crystal display, as taught by Yang.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

03/17/06

Harold Pyon

HAROLD PYON
SUPERVISORY PATENT EXAMINER

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